

TM 9-294

★ RESTRICTED

2.36-INCH A.T. ROCKET LAUNCHER M1A1

TM 9-294

WAR DEPARTMENT

TECHNICAL MANUAL

**2.36-INCH A.T. ROCKET
LAUNCHER M1A1**

27 SEPTEMBER 1943

★ Dissemination of restricted matter — The information contained in restricted documents and the essential characteristics of restricted materiel may be given to any person known to be in the service of the United States and to persons of undoubted loyalty and discretion who are cooperating in Government work, but will not be communicated to the public or to the press except by authorized military public relations agencies. (See also paragraph 18 b, AR 380-5, 28 September 1942.)

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TECHNICAL MANUAL }
No. 9-294 }WAR DEPARTMENT
Washington, 27 September 1943**2.36-INCH A.T. ROCKET LAUNCHER M1A1**Prepared under the direction of the
Chief of Ordnance**CONTENTS**

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2.36-INCH A.T. ROCKET LAUNCHER M1A1

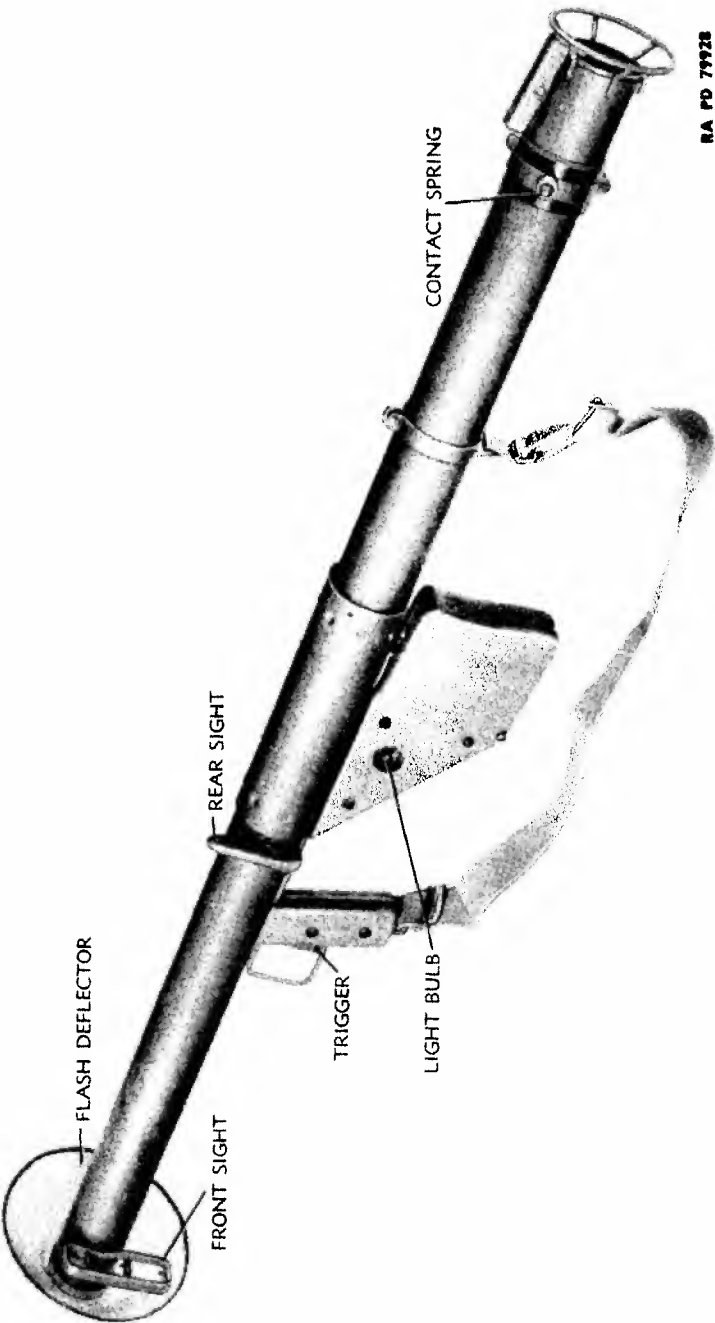


Figure 1 — 2.36-Inch AT Rocket Launcher M1A1 — Left Side View

Section I

INTRODUCTION

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1. SCOPE.

a. This manual is published for the information and guidance of personnel charged with the operation and maintenance of the 2.36-inch AT Rocket Launcher M1A1. It contains information required by the using arms to identify, use, care, and preserve the materiel and the ammunition used therewith. In addition, it contains information required by ordnance personnel for the maintenance and repair of the materiel.

2. CHARACTERISTICS (figs. 1 and 2).

a. The 2.36-inch AT Rocket Launcher M1A1 is an electrically operated weapon of the open tube type. It is fired from the shoulder in the standing, kneeling, sitting, or prone positions. It is used to launch high-explosive rockets against tanks, armored vehicles, pill boxes, and emplacements. The rockets weigh approximately 3½ pounds and are capable of penetrating heavy armor at angles of impact up to 30 degrees. The weapon can be aimed up to distances of 300 yards. Greater ranges may be obtained by estimating the angle of elevation. The maximum range is 700 yards.

3. DATA.

Length of launcher (approx.)	54.5 in.
Weight of launcher (approx.)	13.26 lb
Internal diameter	2.37 in.
Length of rocket	21.6 in.
Weight of rocket	3.5 lb
Muzzle velocity	265 ft per sec

4. PRECAUTIONS.

a. Do not expose rockets to the sun except when immediately ready to load. Store rockets in their containers in shaded places.

b. Do not allow a rocket to remain in a hot launcher prior to firing.

c. Rockets as shipped contain a small cardboard plug cemented over the nozzle in the forward end of the fin assembly. This prevents entry of moisture or dirt into the propellant charge during storage and handling. Do not use any rocket with a missing cardboard plug. Do not remove the plug.

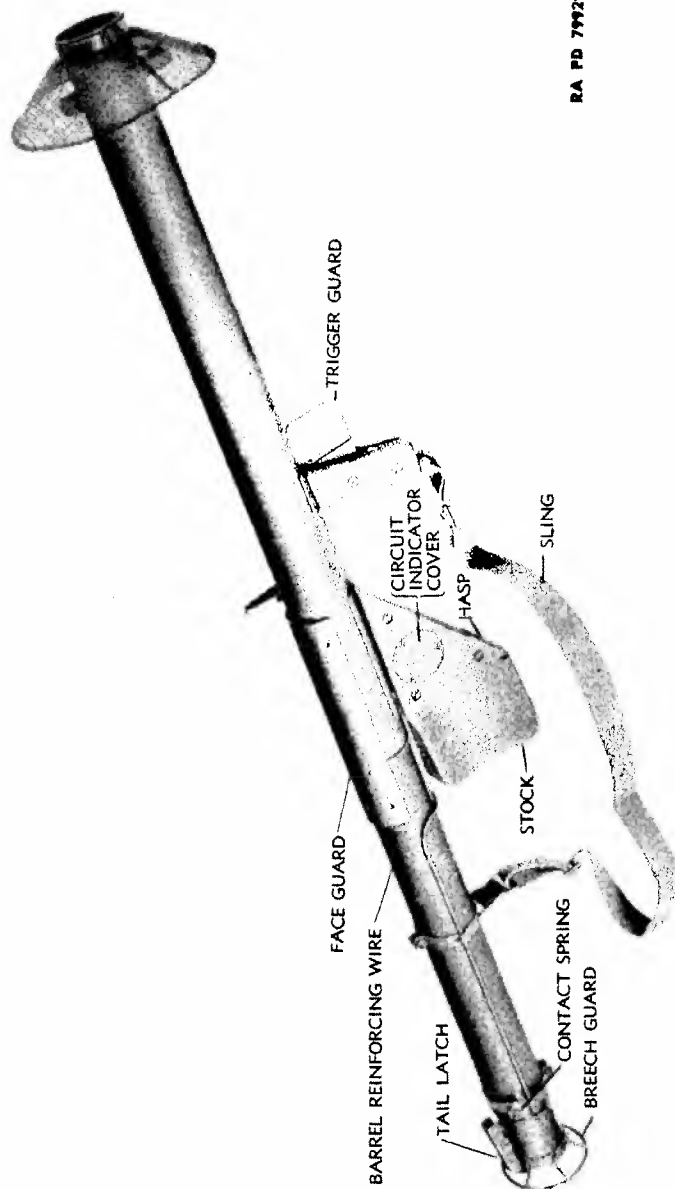


Figure 2 — 2.36-Inch AT Rocket Launcher M1A1 — Right Side View

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[A.G. 300.7 (2 Sep 43)
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BY ORDER OF THE SECRETARY OF WAR:

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Chief of Staff.

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The Adjutant General.

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(For explanation of symbols, see FM 21-6.)

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INTRODUCTION

d. Since the fuze of the rocket is quite sensitive, it is important that the rocket be handled carefully after removal of the safety pin, and that it not be dropped. A fall on its nose, after removal of the safety wire, will cause detonation.

e. The burning time of the propellant is approximately 0.02 to 0.03 second, and combustion is complete before the rocket leaves the muzzle, hence there is no flash. Occasionally, however, the burning may, for some reason, be retarded, creating a backflash as the rocket leaves the muzzle. This occurs during cold weather but may also occur at other times. The firer should be protected against this by gloves or cloth wrapped around the hands, goggles, or other protective equipment, such as a gas mask. This precaution is especially important in cold climates or when no flash deflector is available. It is also recommended that both the firer and the loader wear steel helmets when using the launcher.

f. The launcher may be fired from the shoulder in the standing, kneeling, sitting, or prone positions. If fired from the prone position, the body should be at an angle of at least 45 degrees to the direction of fire so as to avoid injury from the back blast of the rocket.

g. In using the launcher, it is essential that no personnel, or inflammable material be directly behind the launcher within a distance of 20 feet.

h. Never stand in or near the rear of the launcher while it is being fired because the hot gases can inflict serious burns. When firing from trenches or fox holes, clearance should be provided so that back blast is not deflected against personnel.

i. At temperatures below 14 F, the dry cells become too weak to fire this weapon. When used at low temperatures, batteries should be removed from the launcher and kept warm until just before firing. Carrying the batteries in inner pockets in cold climates will keep them sufficiently warm. The spare batteries can be carried in the pockets and switched with the cold ones every half hour.

j. The rockets should not be fired at temperatures below zero F nor above 120 F.

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Section II

DESCRIPTION AND FUNCTIONING

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5. DESCRIPTION (figs. 1, 2, 11, 12, 13, and 14).

a. The launcher is essentially a long open barrel with a stock which houses the electrical firing mechanism. The tube is approximately 54 inches long and has a smooth bore.

b. The launcher has a front and rear sight, both of which are fixed to the barrel on the left side. The rear sight is of the peep type. The front sight consists of three studs which are used for ranges of 100, 200, and 300 yards. Intermediate or greater ranges, lead, and windage must be estimated by the firer.

c. Ahead of the front sight is assembled a flash deflector (fig. 3). The deflector is a conical wire screen with a mounting clamp. It is secured to the tube by the deflector screw and nut. When properly assembled, the mounting clamp of the deflector overlaps the muzzle end of the launcher. The function of the deflector is to deflect occasional particles of unburned powder which might impinge upon the firer's face.

d. The hand grip consists of the left and right trigger grips attached to the trigger support. The trigger support accommodates the trigger guard, trigger, and the lower and upper trigger switch contacts. The trigger is pinned at its upper end to the trigger support and is free to pivot. When the trigger is squeezed, it presses the bar contact against the lower trigger switch contact to complete the electric circuit. When the pressure on the trigger is released, the trigger spring forces the trigger to the forward position so as to break the electric circuit.

e. The stock has a narrow vertical slot by means of which it slips over the stock support to which it is attached by screws. In the bottom of the stock there are two vertical cylindrical compartments for accommodating four batteries. The two batteries in the rear compartment are in actual use; the two batteries in the front compartment are spares. On the left side of the stock is a small electric lamp for testing the electric circuit and battery. The lamp is connected in parallel with the firing mechanism and it lights when the trigger is squeezed, regardless of whether a rocket is in the launcher or not. A spare lamp is carried in a circular compartment on the right side of the stock under the circuit indicator cover. The bottom of the

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42. STANDARD NOMENCLATURE LISTS.

- a. Cleaning, preserving and lubricating materials; recoil fluids, special oils, and miscellaneous related items SNL K-1
- b. Launcher, rocket, A.T. 2.36-in. M1 and M1A1.... SNL B-36
- c. Rockets, all types and components..... SNL S-9
- d. Soldering, brazing and welding material, gases and related items SNL K-2
- e. Tools, maintenance, for repair of small and hand arms, and pyrotechnic projectors SNL B-20
- f. Truck, small arms repair, M1..... SNL G-72
- g. Truck, 2½-ton, 6 x 6, small arms repair, M7 and M7A1 SNL G-138

Current Standard Nomenclature Lists are as tabulated here. An up-to-date list of SNL's is maintained as the "Ordnance Publications for Supply Index," now published in OFSB 1-1

43. EXPLANATORY PUBLICATIONS.

a. Ammunition.

- Ammunition, general TM 9-1900
- Ammunition identification code..... OFSB 3-14
- Range regulations for firing ammunition for training and target practice AR 750-10

b. Maintenance.

- Chemical decontamination materials and equipment... TM 3-220
- Cleaning, preserving, lubricating, and welding materials and similar items of issue by the Ordnance Department TM 9-850
- Defense against chemical attack..... FM 21-40
- Inspection of ordnance materiel..... TM 9-1100

c. Ordnance Storage and Shipment.

- Instructions and specifications for packaging ordnance general supplies IOSSC-(a)
- Instructions for marking shipments of ordnance supplies IOSSC-(b)
- Ordnance storage and shipment chart — group B — major items OSSC-B

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(2) PACKING PROCEDURE (figs. 19 and 20).

(a) Wrap launchers at both ends with greaseproof-waterproof paper and securely bind with TAPE, adhesive, nonhygroscopic.

(b) Wrap each flash deflector with greaseproof-waterproof paper and telescope six wrapped deflectors together.

(c) Cushioning material, such as paper or felt padding, shall be wrapped around launchers where contact is made with blocking in order to prevent chafing of paint.

(d) Entire inside of box shall be lined with an approved type C waterproof paper as specified in U. S. Army Specification No. 100-14A and the edges shall be coated with asphaltum.

(e) Place two blocks (7) and block (11) in guides (5) and slide to bottom of box with cut-outs facing up.

(f) Place two launchers (in opposite directions) on blocks (7) and (11) with the conduit tube facing up. Make sure that cushioning material is separating blocks from launchers.

(g) Place two blocks (8) over launchers with the notched groove of one side of block directly over the conduit tube. Place block (12) in position.

(h) Place six flash deflectors in position on bottom of box with hold-down strip (6) covering flash deflectors as shown in figure 20.

(i) Repeat above operations until box is packed assembling blocks as indicated in figure 20, making sure that three launchers are all in one direction and the other three are in the opposite direction with the conduit tubing facing up.

41. STORAGE.

a. The launcher should be prepared and packed in the same manner as described in paragraph 40 before being stored.

DESCRIPTION AND FUNCTIONING

stock is fitted with a hasp assembly which keeps the batteries in position and completes the electric circuit. The hasp assembly is kept closed by a spring actuated hasp catch which engages the stock pin. The battery spring contacts the batteries and is connected by wire to the stock support to complete the electric circuit.

f. The face guard is on the barrel above the stock. The guard serves to protect the firer's face from the heat in the tube. The guard is pressed on to the barrel and is held in position by its tension.

g. The portion of the barrel from the rear of the stock to the insulated contact spring is wound with bracing wire. The contact springs serve as connecting points for the contact wire leading from the rocket. In this manner, the circuit is completed. At the rear of the barrel is a spring actuated tail latch assembly. The function of the latch is to engage notches on the tail of the rocket and hold it in position for firing. The breech guard at the breech end of the barrel facilitates loading of the rocket, protects the tail latch assembly, prevents distortion of the end of the barrel, and prevents entry of dirt and foreign material when the end of launcher rests on the ground.

h. When the 2.36-inch AT Rocket Launcher M1A1 is issued, it is equipped with a battery designated as the Eveready 791-A, to provide current for operating the firing mechanism. This battery consists of two dry cell batteries of the Eveready No. BA-42 type, size C, which are jointed together and placed in a cardboard container. When replacement is necessary and a battery of the original type cannot be supplied by ordnance personnel, two separate cells of the battery BA-42 type will be used. These cells are a standard Signal Corps item which are readily available in the field. Each is $1\frac{5}{16}$ inch in diameter and $11\frac{5}{16}$ inches in over-all length.

6. FUNCTIONING.

a. When the trigger is squeezed, it forces the bar contact against the lower trigger switch contact to complete the circuit.

b. The passage of the electric current through the rocket sets off an electric igniter in the rocket which in turn ignites the propelling charge. Rearward escape of the powder gases through a jet forces the rocket out of the barrel with a muzzle velocity of about 265 feet per second. Propulsion of the rocket is by jet action of the propellant powder and hence there is no recoil.

2.36-INCH A.T. ROCKET LAUNCHER M1A1

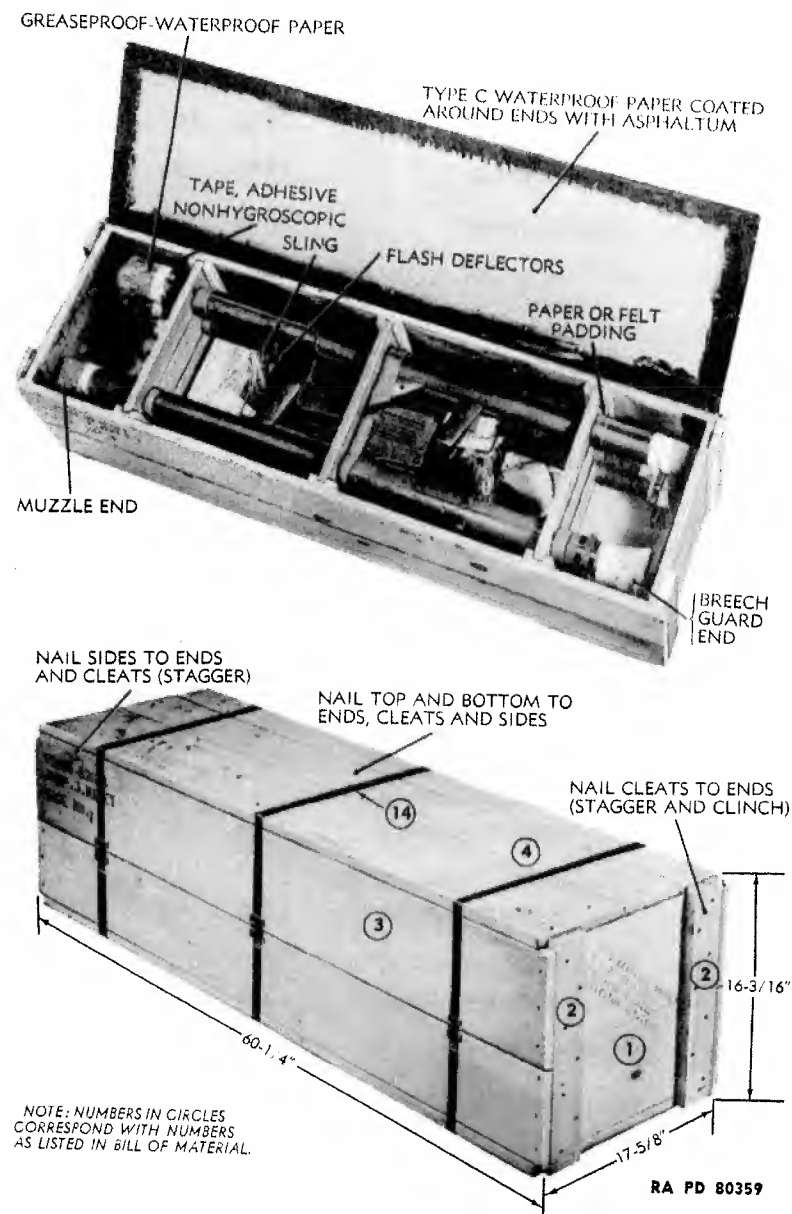


Figure 19 — Packing Box for Six Launchers, Rocket, AT, M1A1, w/Slings and Flash Deflectors

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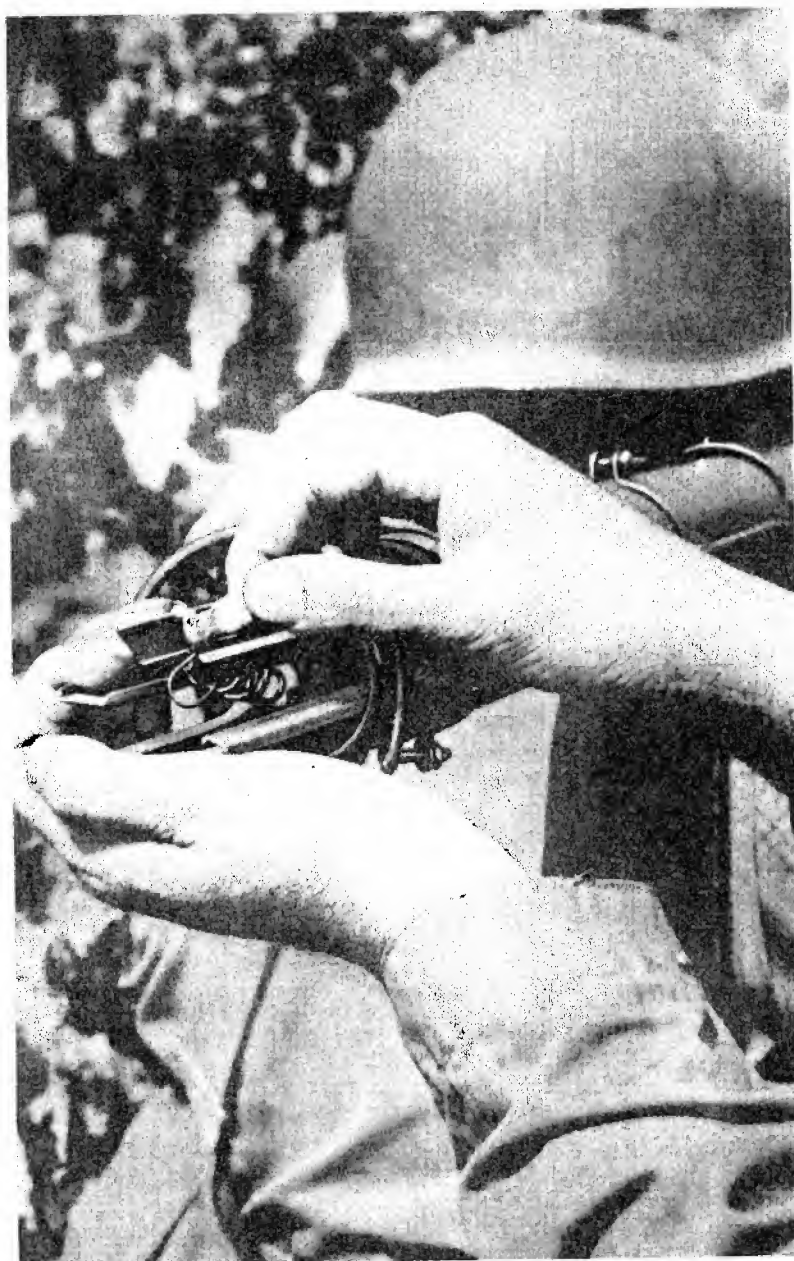
OPERATION



Figure 3 — Loading Rocket Into Launcher

RA PD 79927

2.36-INCH A.T. ROCKET LAUNCHER M1A1



RA PD 79934

Figure 4 — Pulling the Contact Wire Off the Fin

STORAGE AND SHIPMENT

Indicating Number	Quantity Required	PART NAME	Actual Size — Inches			Wood Group
			Length	Width	Thickness	
1	2	End panels ¹	16 $\frac{1}{8}$	14 $\frac{11}{16}$	$\frac{3}{4}$	I or II
2	4	End cleats	15 $\frac{5}{8}$	2 $\frac{3}{4}$	$\frac{3}{4}$	I or II
3	2	Side panel ¹	60 $\frac{1}{4}$	14 $\frac{11}{16}$	$\frac{3}{4}$	I or II
4	2	Top and bottom panels ¹	58 $\frac{3}{4}$	17 $\frac{5}{8}$	$\frac{3}{4}$	I or II
5	6	Guides (notched)	14 $\frac{11}{16}$	2 $\frac{5}{16}$	$\frac{3}{4}$	I or II
6	1	Flash deflector hold-down strip	16	7	$\frac{1}{4}$	Plywood
7	2	Bottom separator block (front & rear)	15 $\frac{5}{8}$	3	$\frac{3}{4}$	I or II
8	2	Intermediate separator block (front & rear)	15 $\frac{5}{8}$	4 $\frac{3}{4}$	$\frac{3}{4}$	I or II
9	2	Intermediate separator block (front & rear)	15 $\frac{5}{8}$	3 $\frac{15}{16}$	$\frac{3}{4}$	I or II
10	2	Top separator block (front & rear)	15 $\frac{5}{8}$	3	$\frac{3}{4}$	I or II
11	2	Center bottom and top separator block	15 $\frac{5}{8}$	3	$\frac{3}{4}$	I or II
12	1	Center intermediate separator block	15 $\frac{5}{8}$	4 $\frac{3}{4}$	$\frac{3}{4}$	I or II
13	1	Center intermediate separator block	15 $\frac{5}{8}$	3 $\frac{15}{16}$	$\frac{3}{4}$	I or II
14	3	Steel straps ²	70	$\frac{1}{2}$.020	
	3	Strap seals	—	$\frac{1}{2}$	—	
		Type C waterproof paper as required				

Note 1: Sides, top, and bottom may be made of several pieces, one piece for each 3 inches of width, but no piece shall be less than 2 $\frac{1}{2}$ inches wide.

Note 2: Equivalent steel wire may be used.

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(1) Apply SOLVENT, dry-cleaning, to clean cloth attached to a ram rod and swab thoroughly. Repeat this operation until all traces of dirt, grease, and foreign matter have been removed. Dry thoroughly using clean cloths.

(2) Apply soap solution by vigorously swabbing the bore until all traces of contamination have been removed. The bore shall then be rinsed with clean, hot water, and dried thoroughly.

(3) Avoid contact of bare hands with the cleaned surfaces.

d. Preservation of Materiel. Application of preservative shall be performed immediately after cleaning.

(1) Using a ram rod and clean cloths soaked in OIL, lubricating, preservative, medium, swab the bore of the launcher thoroughly using a generous quantity of the preservative.

(2) Repeat operation until all interior surfaces of the bore are thoroughly covered with a protective coating of the preservative.

(3) Apply OIL, lubricating, preservative, medium, to contact springs and flash deflectors.

e. Boxing of Materiel (figs. 19 and 20).

(1) **BILL OF MATERIAL.** The following is a bill of material required to construct one complete nailed wood shipping box, style 4, for six 2.36-inch AT Rocket Launchers M1A1 including slings and flash deflectors referred to in illustrations, figures 19 and 20.

(a) *Data.*

Indicating numbers.....those referred to in illustrations
(figs. 19 and 20)

Type of container.....Style 4 nailed wood box

Gross weight (lb).....155

Dimensions (in.)	Inside	Outside
Length.....	57 1/4	60 1/4
Width.....	16 1/8	17 5/8
Depth.....	14 11/16	16 3/16
Displacement (cu ft).....	10	

OPERATION



RA PD 79931

Figure 5 — Engaging Contact Wire in Contact Spring

2.36-INCH A.T. ROCKET LAUNCHER M1A1

Section XII

STORAGE AND SHIPMENT

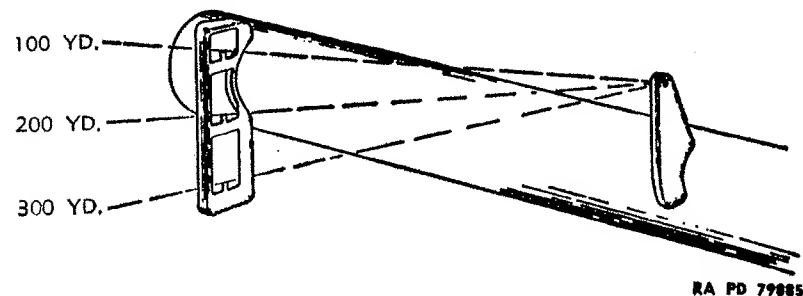


Figure 6 — Aiming the Launcher

10. FIRING.

a. **Firing.** To fire the launcher, the firer squeezes the trigger and releases it.

b. **Firing Positions.** The launcher can be fired in the standing (fig. 7), kneeling (fig. 8), sitting (fig. 9), or prone (fig. 10) positions.

11. UNLOADING.

a. To unload the launcher, the loader removes the wire from the contact spring, raises the tail latch, and carefully withdraws rocket until safety pin can be reinserted. He then inserts safety pin and removes rocket completely from the launcher. He coils and places the contact wire between the fins, and repacks the rocket.

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40. PREPARATION OF 2.36-INCH AT ROCKET LAUNCHER M1A1 PRIOR TO SHIPMENT.

a. **Lubrication.** Lubrication of the 2.36-inch AT Rocket Launcher M1A1 shall be performed as directed in paragraph 16.

b. Painting.

(1) **REMOVING RUST SPOTS.** All painted surfaces that have become checked, pitted, or rusted, shall be thoroughly cleaned with CLOTH, crocus, removing all rust spots. (All external metal surfaces must have a coating of paint, except the contact springs and the flash deflectors. These parts must be completely waterproofed.)

(2) **APPLICATION OF PRIMER, SYNTHETIC, RUST-INHIBITING.** Apply a liberal coating of PRIMER, synthetic, rust-inhibiting over entire area of the cleaned surface to be repainted as follows:

(a) **Brushing or Spraying.** PRIMER, synthetic, rust-inhibiting, should be used on bare metal as a base coat for synthetic enamel. It may be applied either by brushing or spraying. The primer will brush satisfactorily as received or after the addition of not more than 5 percent by volume of the proper thinner. For spraying, the primer may be thinned with not more than 15 percent by volume of thinner. Allow to dry thoroughly.

(3) **SANDPAPERING SURFACES.** Sandpaper the primed surfaces with PAPER, flint, class B, grade No. 00, and wipe all particles of dust from surfaces.

(4) **APPLICATION OF ENAMEL.** Apply coat of ENAMEL, synthetic, olive-drab, lusterless, and allow to dry thoroughly before the materiel is used.

c. **Cleaning.** The bore of the 2.36-inch AT Rocket Launcher M1A1 shall be thoroughly cleaned with SOLVENT, dry-cleaning, or with a soap solution as follows:

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water. If SODA ASH is not available, use warm soap solution, or warm water alone. Then rinse with clear water and wipe thoroughly dry. If the materiel is in fair condition and marred only in spots, these spots should be cleaned and then touched up with ENAMEL, synthetic, olive-drab, lusterless, and permitted to dry. The whole surface should then be sandpapered with PAPER, flint, class B, No. 1, and a finish coat of ENAMEL, synthetic, olive-drab, lusterless, applied and allowed to dry thoroughly before the materiel is used. If the equipment is in bad condition, all parts should be thoroughly sanded with PAPER, flint, class B, No. 2, given a coat of PRIMER, synthetic, refinishing, and permitted to dry for at least 16 hours. They should then be sandpapered with PAPER, flint, class B, No. 00, wiped free from dust and dirt, and given a final coat of ENAMEL, synthetic, olive-drab, lusterless, and allowed to dry thoroughly before the materiel is used.

38. PRESERVATION OF OUTSIDE PAINTED SURFACES.

a. Continued friction or rubbing must be avoided, as it will smooth the surface and produce a gloss. The materiel should not be washed more than once a week. Care should be taken to see that the washing is done entirely with a sponge or a wiping cloth. The surface should never be rubbed or wiped, except while wet, or a gloss will develop.

b. It is not desirable that materiel painted with lusterless enamel be kept as clean as that covered with glossy paint. A small amount of dust increases the camouflage value. Grease spots should be removed with SOLVENT, dry-cleaning. Whatever portion of the spot that cannot be so removed should be allowed to remain.

c. Continued friction of wax-treated tarpaulins on the materiel will also produce a gloss, which should be removed with SOLVENT, dry-cleaning.

d. Tests indicate that repainting with ENAMEL, synthetic, olive-drab, lusterless, is necessary once a year, and restenciling with ENAMEL, synthetic, stenciling, lusterless, blue-drab, twice a year.

39. REMOVAL OF PAINT.

a. After repeated paintings, the paint may crack and scale off in places, presenting an unsightly appearance. If such is the case, remove the old paint with REMOVER, paint and varnish. See TM 9-850 for details. It is important that every trace of paint remover be completely removed with SOLVENT, dry-cleaning, and that the equipment be perfectly dry before repainting is attempted. The surfaces thus prepared should be painted according to directions in paragraph 36.

OPERATION



RA PD 79932

Figure 7 — Position for Firing — Standing

2.36-INCH A.T. ROCKET LAUNCHER M1A1

Section XI

PAINTING

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35. GENERAL.

a. Ordnance materiel is painted before issue to the using arms, and one maintenance coat per year will ordinarily be ample for protection. With but few exceptions, this materiel will be painted with ENAMEL, synthetic, olive-drab, lusterless. The enamel may be applied over old coats of long oil enamel and oil paint previously issued by the Ordnance Department if the old coat is in satisfactory condition for repainting.

b. Paints and enamels are usually issued ready for use and are applied by brush or spray. They may be brushed on satisfactorily when used unthinned in the original package consistency, or when thinned no more than 5 percent by volume with THINNER, for synthetic enamels. The enamel will spray satisfactorily when thinned with 15 percent by volume of thinner. Linseed oil must not be used as a thinner since it will impart a luster not desired in this enamel. If sprayed, it dries hard enough for repainting within ½ hour and dries hard in 16 hours.

c. Complete information on painting is contained in TM 9-850.

d. All external metal surfaces of the launcher must be protected with paint except the contact springs and the flash deflector.

36. PREPARATION OF SURFACES FOR PAINTING.

a. If the base coat on the materiel is in poor condition, it is more desirable to strip the old paint from the surface than to use sanding and touch-up methods. After stripping, it will be necessary to apply a primer coat.

b. PRIMER, synthetic, rust-inhibiting, for bare metal, should be used on metal as a base coat.

c. The effectiveness of a painting job depends partly on the selection of a suitable paint, but largely upon the care used in preparing the surface prior to painting. All parts to be painted should be free of all extraneous matter such as rust, dirt, and grease, and must be dry.

37. PAINTING METAL SURFACES.

a. Metal parts in need of cleaning should be washed with a liquid solution consisting of ½ pound of SODA ASH in 8 quarts of warm



RA PD 79933

Figure 8 — Position for Firing — Kneeling

2.36-INCH A.T. ROCKET LAUNCHER M1A1

parts are apt to dry out and shrink, and a more frequent application of OIL, linseed, raw, type A, will help keep wood in condition. During sand or dust storms the breech and muzzle should be kept covered. Do not fire rockets at temperatures above 120 F.

OPERATION



RA PD 79935

Figure 9 — Position for Firing — Sitting

2.36-INCH A.T. ROCKET LAUNCHER M1A1



RA PD 79930

Figure 10 — Position for Firing — Prone

Section X

OPERATION UNDER UNUSUAL CONDITIONS

	Paragraph
General	32
Arctic climates	33
Tropical climates	34

32. GENERAL.

a. When operating under unusual conditions such as tropical or arctic climates, severe dust or sand conditions, and near salt water, it is essential that all the precautions listed below should be observed.

33. ARCTIC CLIMATES.

a. In temperatures below freezing, and particularly in arctic climates, all operating parts should be kept absolutely free of moisture. The bore of the launcher should be cleaned daily and oiled as described in paragraph 16. The batteries should be removed from the launcher and kept warm until just before firing. Carrying the batteries in inner pockets will keep them sufficiently warm. Immediately upon bringing indoors, the launcher should be cleaned on the outside and inside with a dry clean cloth. Remove the grips and clean and dry the contacts. After it has reached room temperature, clean and dry the launcher again, and oil the bore. Rockets should not be fired at temperatures below zero F.

34. TROPICAL CLIMATES.

a. **Tropical Climates.** In tropical climates where temperature and humidity are high, or where salt air is present, and during rainy seasons, the launcher should be thoroughly inspected and cleaned daily. The bore should be oiled a little more liberally than prescribed in paragraph 16. Wood parts should be inspected to see that swelling due to moisture does not bind working parts. If this does occur, shave off only enough wood to relieve binding. A light coat of OIL, linseed, raw, type A applied at least every month and well rubbed in with the heel of the hand, will help to keep moisture out. Allow oil to soak in for a few hours and then, wipe and polish the wood with a dry clean wiping cloth. Do not fire rockets at temperatures above 120 F.

NOTE: Care should be taken to see that linseed oil does not get onto electric contacts as it will gum when dry.

b. **Hot Dry Climates.** In hot dry climates, where sand and dust are apt to get into the bore, the launcher including the bore should be wiped clean daily or more often if necessary. Oiling of the bore should be done very sparingly and only in the event that atmospheric conditions cause rusting of the bore surface. In such climates, wood

2.36-INCH A.T. ROCKET LAUNCHER M1A1

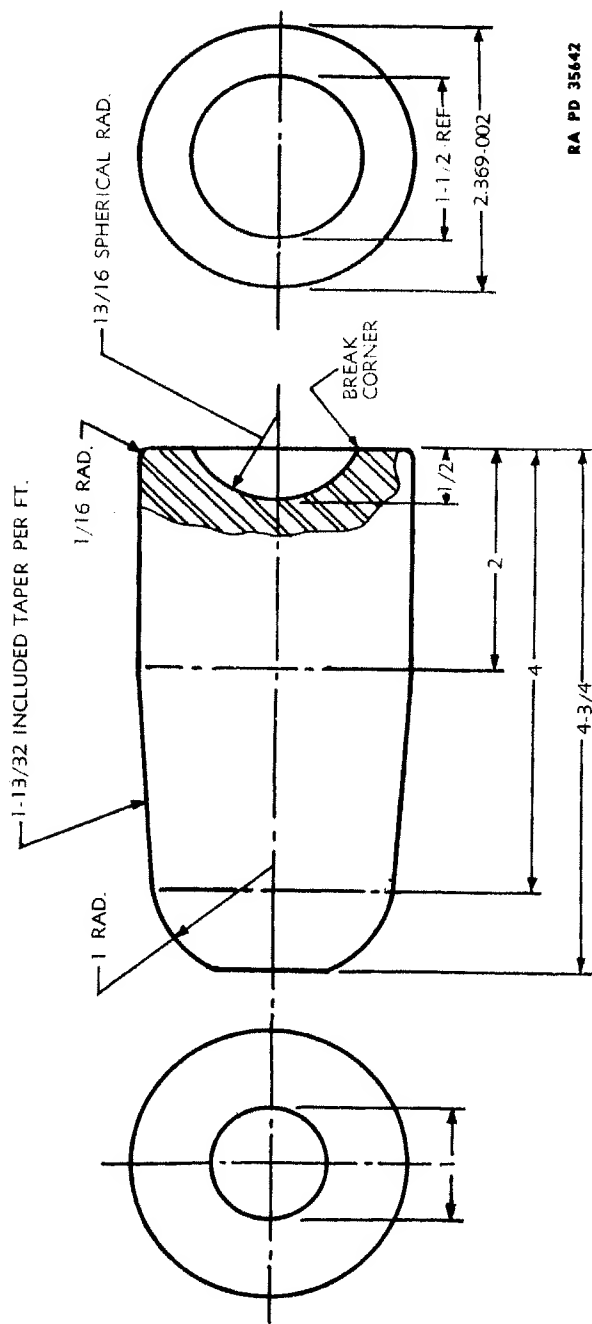


Figure 18 — Large Dent Remover

Section IV MALFUNCTIONS AND CORRECTIONS

	Paragraph
General	12
Immediate action	13
Malfunctions and corrections	14

12. GENERAL.

a. This section is intended to provide necessary instruction in the related subjects of immediate action, and malfunctions and corrections. These instructions should be studied by the firer and loader before any firing is done.

13. IMMEDIATE ACTION.

a. **Definition.** Immediate action is the immediate and automatic application of a remedy to fire the launcher if it malfunctions while firing in actual or simulated combat. When a stoppage occurs during firing, perform the immediate action described below.

b. **Failure of Launcher to Fire.** If the loaded launcher fails to fire when the trigger is squeezed, proceed as follows:

- (1) Squeeze the trigger again to fire the launcher.
- (2) If the launcher still does not fire, then the loader cautiously makes certain that the uninsulated portion of the contact wire engages the contact spring. The firer then squeezes the trigger to fire the launcher.
- (3) If the launcher still does not fire, the loader waits 1 minute and then removes wire from contact spring, raises tail latch, and carefully withdraws rocket until safety pin can be reinserted. He then inserts safety pin and removes rocket completely from the launcher, coils and places the contact wire between the fins, repacks the rocket, and puts it aside for disposal by authorized personnel.

14. MALFUNCTIONS AND CORRECTIONS.

a. **General.** Proper care of the launcher before, during, and after firing will eliminate most malfunctions. Malfunctions which cannot be remedied by immediate action should be dealt with in accordance with instructions described in the following step:

- (1) **FAILURE TO FIRE.**
 - (a) Failure to fire is generally caused by defective ammunition or defective firing mechanism.
 - (b) If the contact wire is loosely connected to the rocket, the rocket may be defective and should be turned over to ordnance maintenance personnel.
 - (c) Defective firing mechanism may be due to spent or defective batteries, loose connections, or broken parts.

2.36-INCH A.T. ROCKET LAUNCHER M1A1

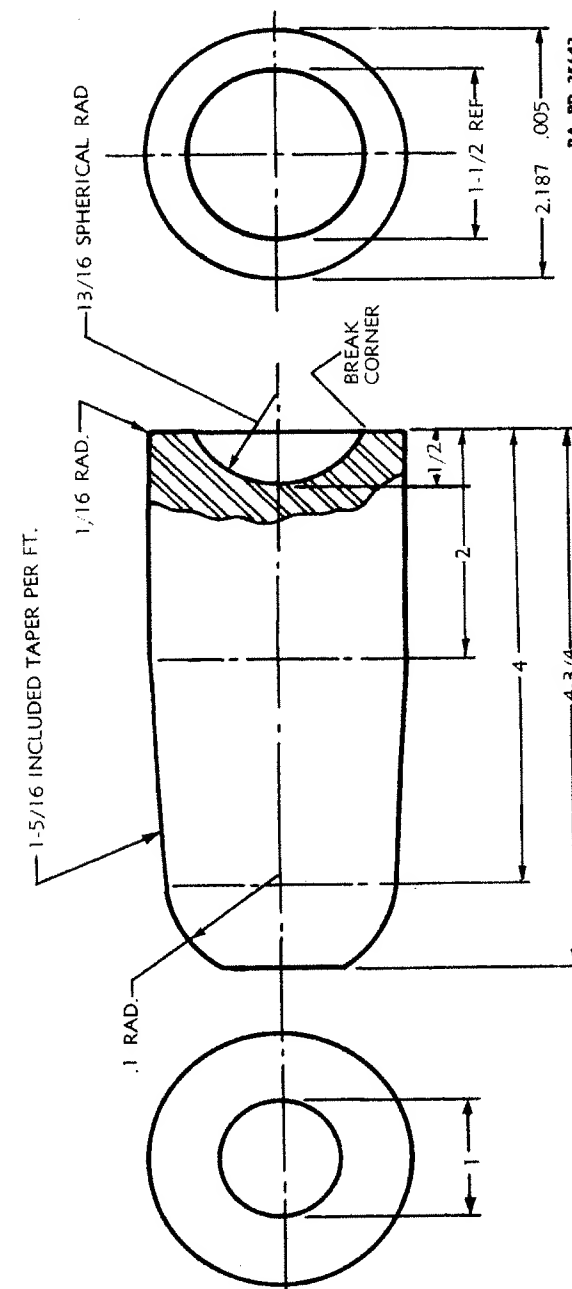
1. Check the batteries by squeezing the trigger and observing whether the bulb lights. If the bulb does not light, replace the batteries and test again. If the bulb still does not light, change the bulb. A spare bulb is carried under the circuit indicator cover, and may be used if the bulb is broken or burnt out.

2. Remove the trigger grips and check the trigger switch contacts for loose or broken parts. If the bar contact is deformed, bend it into correct shape. If bar is broken, turn launcher over to ordnance maintenance personnel.

3. Check whether the battery spring contacts the batteries. If the spring is broken, spread it out so that it will contact the batteries (this should only be done in an emergency).

4. Remove the circuit indicator cover and check whether the wires are loose.

5. Test by hand whether the wire is securely connected to the stock contact. If the connection is broken, turn the launcher over to ordnance maintenance personnel.

MAINTENANCE AND REPAIR**Figure 17 — Small Dent Remover**

2.36-INCH A.T. ROCKET LAUNCHER M1A1

Section IX

MAINTENANCE AND REPAIR

	Paragraph
Preventive maintenance	30
Repairs.....	31

30. PREVENTIVE MAINTENANCE (figs. 11, 12, and 13).

- a. These instructions may be carried out by the using arms.
- b. Tighten all screws and nuts to prevent their becoming loose in service. This should be done periodically when the weapon is in service. Clean all rust and pitted surfaces with **CLOTH**, crocus, and repaint with **ENAMEL**, synthetic, olive-drab, lusterless.

31. REPAIRS.

- a. The following operations must be performed by a company mechanic or ordnance maintenance personnel.

- b. Solder all loose or broken soldered connections.
- c. Replace any defective bulbs.
- d. Remove dents in the barrel by using the tools shown in figures 17 and 18. These tools should be improvised by the ordnance machinist.

(1) Drive the small dent remover (fig. 17) through the barrel. This will increase the diameter of the dented part of the barrel up to 2.187 inches.

(2) Drive the large dent remover (fig. 18) through the barrel. This will bring the diameter of the dented part of the barrel back to the original 2.369 inches.

(3) To restore the original round contour of the barrel, force the dent remover in place under the dents. Using the dent remover as an anvil, hammer the outside surface of the barrel with a ball-peen hammer.

- e. Replace the trigger assembly if the trigger spring is too weak or if trigger stop is missing.

- f. If tail latch does not function, replace the tail latch spring.

- g. Replace the trigger grips if broken or cracked so that moisture cannot get in.

- h. If the bar contact is deformed, it may be bent to its proper shape to enable firing of the launcher. This should be replaced as soon as practicable.

- i. If electrical contact points are corroded, clean with **CLOTH**, crocus.

Section V

CARE AND PRESERVATION

	Paragraph
General	15
Cleaning and care of launcher.....	16

15. GENERAL.

- a. Proper functioning and accuracy of firing depend largely on care and cleaning of the weapon. The weapon should be checked daily for cleanliness, in garrison or camp, on the range, and in the field. See that the bore is free of dust, dirt, mud, snow, or other foreign material.

16. CLEANING AND CARE OF LAUNCHER.

- a. **Daily and Immediately After Firing.** Wet a **CLOTH**, wiping, with **CLEANER**, rifle bore, and run it through the barrel several times. Then run a dry wiping cloth through until the inside of the barrel is clean and dry. Saturate a clean dry wiping cloth with **OIL**, lubricating, preservative, light, and then wring it out. Oil the bore by running this cloth back and forth through the barrel.

- b. **Weekly.** Apply one or two drops of **OIL**, lubricating, preservative, light, to the tail hinge pin.

- c. **Prior to Firing.** Run a clean dry wiping cloth through the barrel until, by the appearance of the cloth, it is indicated that the film of oil has been removed from the bore.

- d. **External Parts of the Launcher.** When necessary, clean the rusted, pitted, and chipped exposed metal surfaces with **CLOTH**, crocus, and repaint with **ENAMEL**, synthetic, olive-drab, lusterless. Do not paint the contact springs or the flash deflector. To clean wooden stock and grip, wipe with a clean wiping cloth lightly oiled with **OIL**, linseed, raw, type A. Then wipe with a clean dry wiping cloth. Do not use cloths which have been impregnated with raw linseed oil on any other parts of the launcher.

- e. **If Used in Wet Weather.** Disassemble the stock and trigger grips and dry all electric contact points and wires with a dry cloth. Clean and oil the rest of the launcher as described above.

2.36-INCH A.T. ROCKET LAUNCHER M1A1

Section VI

DISASSEMBLY AND ASSEMBLY

	Paragraph
General.....	17
Disassembly	18
Assembly	19

17. GENERAL.

a. For ordinary care and cleaning it is not necessary to disassemble the launcher except to remove the trigger grips. Further disassembly is for the purpose of inspection, maintenance, and repair, and should be performed under the supervision of a mechanic or ordnance personnel.

18. DISASSEMBLY (figs. 11, 12, and 13).

a. **Flash Deflector.** Unscrew the screw from the flash deflector and remove the deflector, taking care not to lose the screw, nut, and washer.

b. **Sling.** Disconnect the sling from the sling loops on the launcher.

c. **Trigger.** Unscrew the sling bracket screws and remove the sling bracket. Unscrew the screws on the left trigger grip and remove the trigger grips. Remove the cotter pin, withdraw the trigger pin, and remove the trigger. Break the soldered connection between the wire and the lower switch contact support. Pry the conduit with the wire loose from the clips on the left side of the stock support.

d. **Circuit Indicator Cover and Bulb.** Unscrew the screws from the circuit indicator cover. Remove the cover and break the soldered wire connection. Remove the spare bulb and the socket assembly with bulb.

e. **Stock.** Open the hasp on the under side of the stock and remove the batteries. Remove the four screws from the hasp, and remove the hasp. Break the soldered connection between the wire and the stock support. Slide the stock off the support.

f. **Tail Latch.** Press down on tail latch body, remove cotter pin and tail latch pivot pin, and carefully withdraw the tail latch spring.

g. **Electrical System.** The electrical system of the rocket launcher is shown in figure 14.

19. ASSEMBLY.

a. **Tail Latch.** Place tail latch spring in position over the stud between tail latch shunt and tail latch body. Press down on tail latch body and insert the tail latch pivot pin; secure it with the cotter pin.

Section VIII

INSPECTION

	Paragraph
Purpose.....	28
Procedure.....	29

28. PURPOSE.

a. Inspection of your materiel is vital. Thorough systematic inspection at regular intervals is the best insurance against an unexpected breakdown at the critical moment when performance is absolutely necessary. Never let your materiel run down; keep it in first class fighting condition by vigilant inspection and prompt maintenance.

b. Inspection is for the purposes of determining the condition of the materiel and the repairs or adjustments necessary to insure serviceability and proper functioning. Its immediate aim is preventive maintenance which includes inspection for any damage caused by improper handling before delivery into your hands and inspection for ordinary wear so as to prevent malfunctioning. It also pertains to correction of defects that may later require replacement of parts.

29. PROCEDURE (figs. 11, 12, and 13).

a. Inspect the launcher for general condition, loose or broken components, painting defects, bends, dents, or for obstructions in the bore.

b. Test the electric circuit by squeezing the trigger several times. The bulb should light when the trigger is squeezed. If the bulb does not light, check the batteries and bulb and replace the defective items.

c. Check for any loose wire connections.

d. Remove the trigger grips and check for the following:

(1) Deformed or broken switch contact bar.

(2) Missing switch contact button.

(3) Missing bar contact.

(4) Missing switch contact lower support rivet.

(5) Loose connections, particularly between bar contact and upper switch contact support, and between wire and upper and lower switch contact supports.

(6) Corroded electric contact points.

e. Remove the circuit indicator cover and check for loose wire connection. Remove the hasp and check for loose connection between wire and stock support.

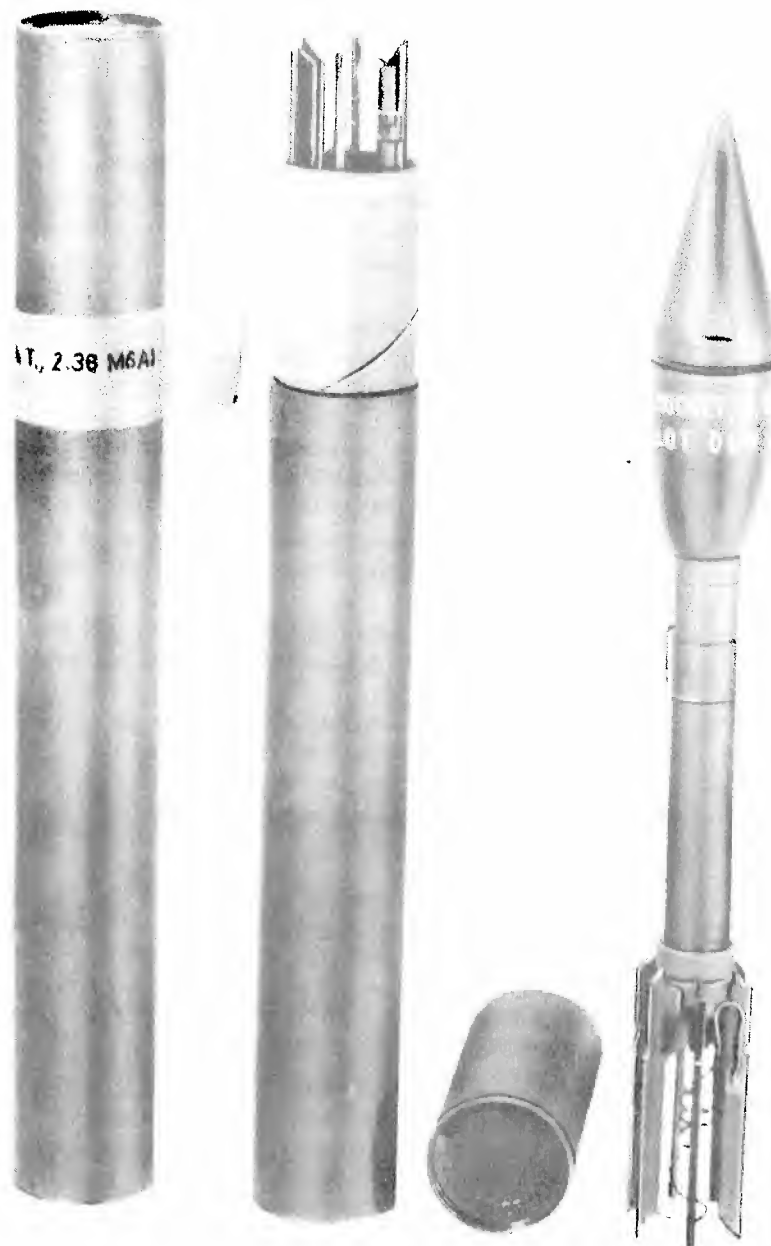
f. Remove the batteries and examine for condition. Replace them if they are cracked, swollen, broken, or do not light the bulb.

g. Check functioning of tail latch and of trigger spring.

h. Examine the barrel of the launcher for rust, scale, and dents.

i. Examine the contact springs to see that they are secure to the clamp and that they are clean and free from rust, paint, and grease.

2.36-INCH A.T. ROCKET LAUNCHER M1A1



RA PD 69103

Figure 16 — Packing of 2.36" Rockets

DISASSEMBLY AND ASSEMBLY

b. Soldered Connections. Solder the broken connections between the wire and lower switch contact, between the wire and stock contact, and between the wire (on the battery spring) and the bottom of the stock support.

c. Stock. Slide the stock partly onto the stock support. Keep the wire between stock support and battery spring, moving in the slot in the stock so as not to break the soldered connections. Replace the conduit with the wire in the clips on the left side of the stock support. Push stock into position on the stock support.

d. Circuit Indicator Cover and Bulb. Assemble light bulb to miniature socket. Place unit in transverse hole in stock and secure socket with two screws. Pull the socket wires out through the hole in top of stock and solder to the wires leading from the conduits on right side of stock support. Replace circuit indicator cover and secure with the three screws. Attach the hasp spring to the hasp and assemble the hasp to the stock. Replace the batteries in their compartments.

e. Trigger Grips and Sling. Attach the trigger grips to the trigger support. Attach the sling bracket to the trigger grips and secure the sling to the launcher.

f. Flash Deflector. Slide the flash deflector over the muzzle of the barrel and secure in place by means of the nut, screw, and washer.

2.36-INCH A.T. ROCKET LAUNCHER M1A1

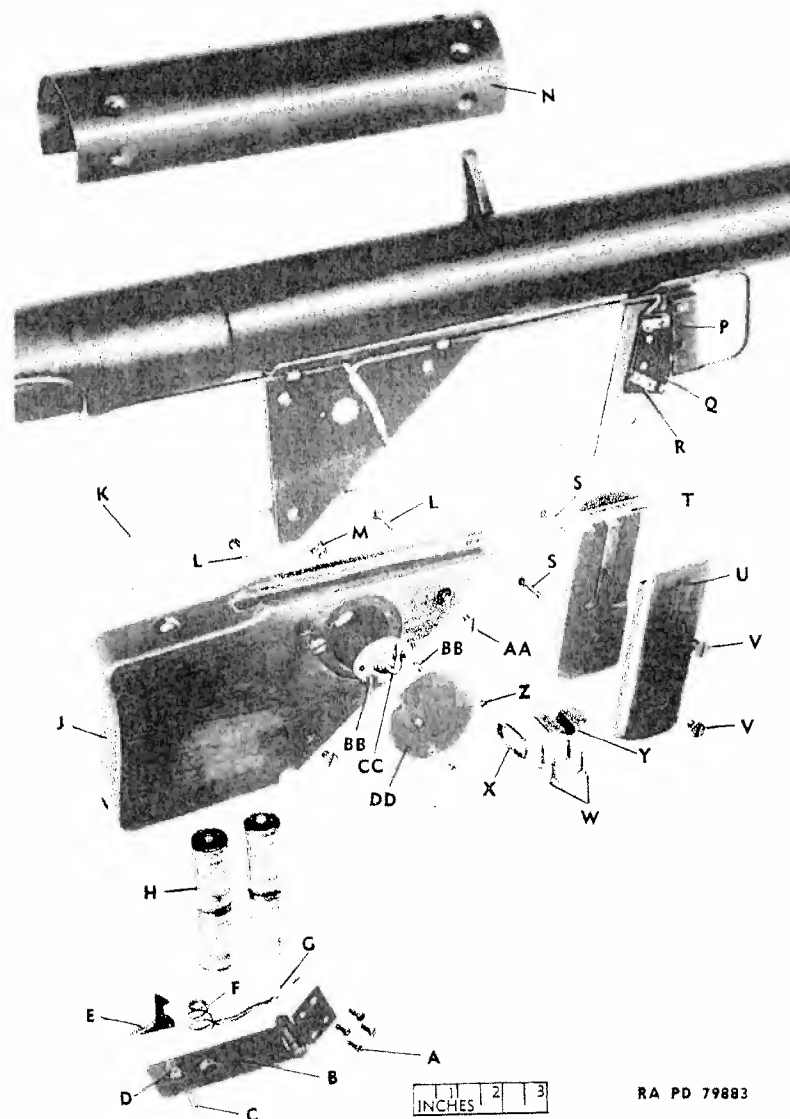


Figure 11 — Stock and Grip Group — Parts

AMMUNITION

excess of 300 yards, the angle of impact is steep enough to cause a detonation which resembles that of a 75-mm high-explosive shell. However, impact on a very soft material such as mud, soft sand, or water will not cause detonation of the rocket.

25. CARE AND PRECAUTIONS IN HANDLING.

a. Ammunition is packed to withstand all conditions ordinarily encountered; however, the following should be observed:

(1) Boxes containing ammunition should not be dropped, thrown, tumbled, or dragged.

(2) The waterproof sealing of ammunition containers should not be broken until the ammunition is about to be used. Items unpacked but not used should be restored to their original condition and packings and resealed.

b. Rockets should be protected against moisture and extremes of temperature. They should not be stored where temperatures exceed 120 F and should not be exposed to the direct rays of the sun.

c. In firing rockets, consideration should be given to the blast of flame to the rear. The loader should exercise particular care to stand clear of the blast.

d. Rockets prepared for firing and not fired will have the safety pin replaced and will be returned to the original container which will be resealed.

e. If a rocket fails to fire and examination shows the launcher is not at fault, the safety pin will be replaced and the rocket set aside for destruction by authorized personnel.

f. Rockets must not be disassembled.

26. PACKING.

a. The 2.36" rocket is packed (fig. 16) one per fiber container. Each fiber container is sealed with a strip of adhesive tape (yellow for H.E., A.T., M6A1, and blue for practice Rockets M7A1), printed with the type and model of the rocket. Twenty such containers are packed to the wooden box, 1.55 x 1.13 x 2.08 feet. As packed, the box weighs approximately 128 pounds.

27. FIELD REPORT OF ACCIDENTS.

a. When an accident involving the use of ammunition occurs during training practice, the procedure prescribed in section VII, AR 750-10, will be observed by the ordnance officer under whose supervision the ammunition is maintained or issued. Where practicable, reports covering malfunctions of ammunition in combat will be made to the Chief of Ordnance, giving the type of malfunction, type of ammunition, the lot number of the complete rounds or separate-loading components, and condition under which fired.

2.36-INCH A.T. ROCKET LAUNCHER M1A1

(2) Insert head of rocket in launcher, remove safety pin from tube, and complete insertion of rocket in launcher as described in paragraph 8.

(3) By means of the tab formed on the end, pull the contact wire from its taped attachment to the fin (fig. 15). Complete instructions for loading are contained in paragraph 8.

NOTE: No attempt should be made to remove the short wire which is soldered to the fin. Do not break or disconnect the contact wire at the point where it enters the rocket.

23. DATA.

a. The 2.36" rockets are 21.6 inches long and weigh 3.5 pounds. Fired from the launcher, they have a muzzle velocity of approximately 265 feet per second. Maximum range is 700 yards but limit of effective aimed fire is 300 yards.

b. Since the effect of the H.E., A.T. rocket is produced entirely by the high order explosion of the head, the rocket will produce the same effect regardless of its velocity at impact, provided the impact is sufficient to operate the fuze. After the safety pin has been removed, a blow, equivalent to dropping the rocket on its nose on normal soil, will operate the fuze and detonate the rocket. Light impacts insufficient to detonate the fuze, will increase its sensitivity so that the fuze will detonate on receiving a lighter impact than ordinarily necessary for functioning.

c. The propelling charge normally burns in 0.02 to 0.03 second, that is, burning is complete before the rocket leaves the launcher.

24. EFFECT.

a. **ROCKET, H.E., A.T., 2.36", M6A1**, has effect against various targets as follows:

(1) **ARMOR PLATE.** Penetration of armor found on most tanks may be expected at all ranges. A hole is blown through the armor and heated particles of metal are sprayed through in a cone shaped pattern. Any ammunition within this pattern is usually exploded.

(2) **MASONRY.** Penetration of brick and masonry from several inches to a foot or more, depending on quality of structure, may be expected.

(3) **STRUCTURAL STEEL.** Produces shattering effect against cast steels and such materials as girders and railroad rails. Produces extensive damage, probably irreparable, to motor blocks.

(4) **WOOD.** Penetration of timber from several inches to a foot or more, depending on the timber, may be expected.

(5) **SOIL.** Impact with ground at ranges below 300 yards will ordinarily result in a ricochet rather than a detonation. At ranges in

DISASSEMBLY AND ASSEMBLY

A — SCREWS
B — HASP
C — RIVET
D — HASP CATCH SPRING
E — HASP CATCH
F — BATTERY SPRING
G — WIRE
H — DRY CELL BATTERIES
J — STOCK
K — CONDUIT TUBE
L — SCREW
M — LIGHT BULB
N — FACE GUARD
P — TRIGGER ASSEMBLY
Q — UPPER TRIGGER SWITCH CONTACT ASSEMBLY
R — LOWER TRIGGER SWITCH CONTACT ASSEMBLY
S — SCREW
T — LEFT TRIGGER GRIP
U — RIGHT TRIGGER GRIP
V — GRIP NUT
W — SCREW
X — SLING LOOP
Y — SLING BRACKET
Z — SCREW
AA — STOCK NUT
BB — SCREW
CC — MINIATURE SOCKET
DD — CIRCUIT INDICATOR COVER

RA PD 79883A

2.36-INCH A.T. ROCKET LAUNCHER M1A1

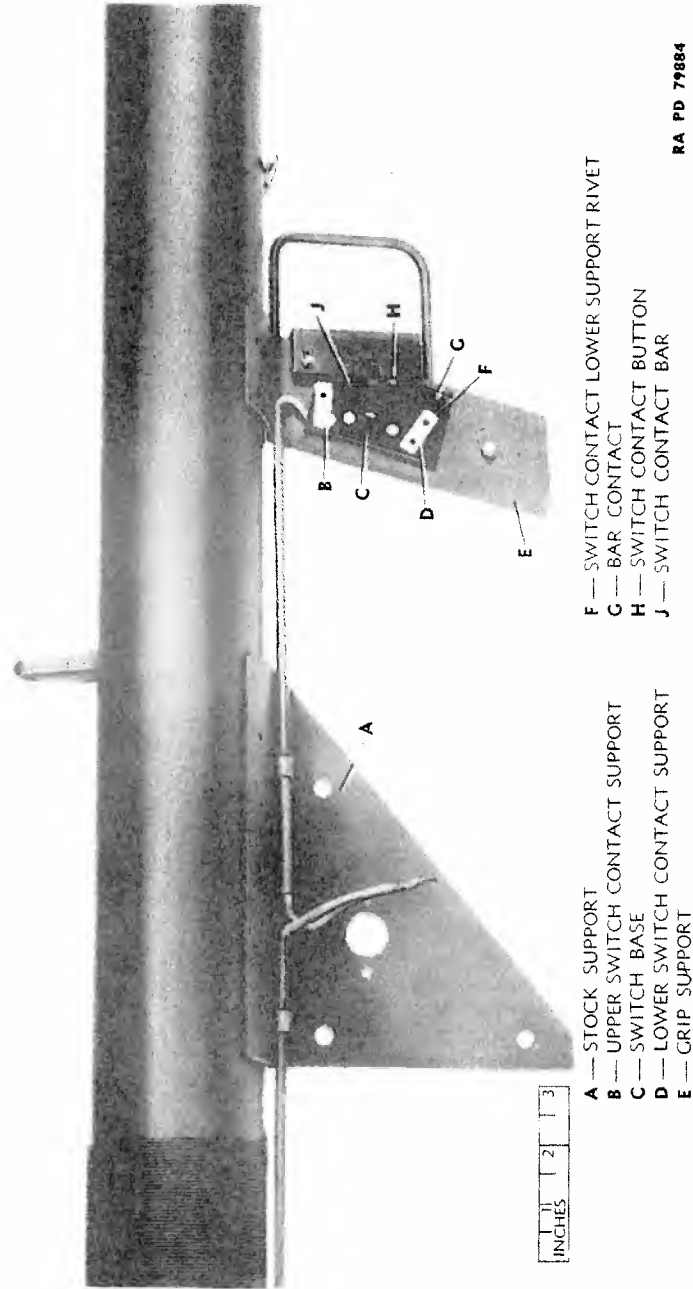


Figure 12 — Trigger Group

AMMUNITION

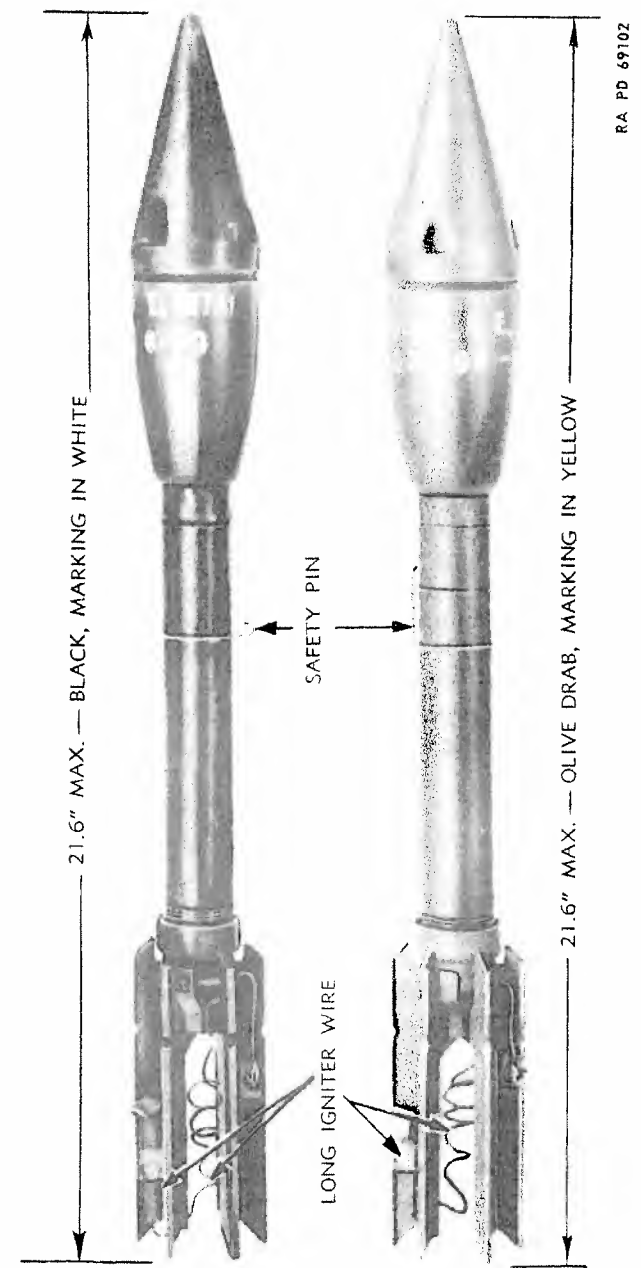


Figure 15 — Rocket, H.E., A.T., 2.36", M6A1 (lower) and Rocket, Practice, A.T., 2.36", M7A1 (upper)

2.36-INCH A.T. ROCKET LAUNCHER M1A1

tion is assigned a five character code symbol. These symbols are listed in Standard Nomenclature Lists and Ordnance Field Service Bulletin No. 3-14.

f. **Data Card.** A 5- x 8-inch card, containing information concerning the ammunition and its components, is sent with each shipment of ammunition. When required, directions for assembly are printed on the reverse of the card.

g. Earlier Models.

(1) Ammunition issued for the Launcher, rocket, A.T., 2.36", M1, was known as the M6 and M7 Rockets. The M1 Launcher is no longer available and the M6 and M7 Rockets cannot be used in the Launcher, rocket, A.T., 2.36", M1A1.

(2) The M6 and M7 Rockets have a contact ring on the nose of the rocket and a connecting wire, taped to the outside, running from this ring to the tail. These are not present on the authorized rounds.

(3) The M6 and M7 Rockets have a cord tied to the safety pin and tail closing plug; the authorized rounds have no such cord.

(4) The M6A3 and M7A3 Rockets have rounded nose and wheel-shaped fin, while the M6A1 and M7A1 have pointed nose and fin without rim.

22. DESCRIPTION.

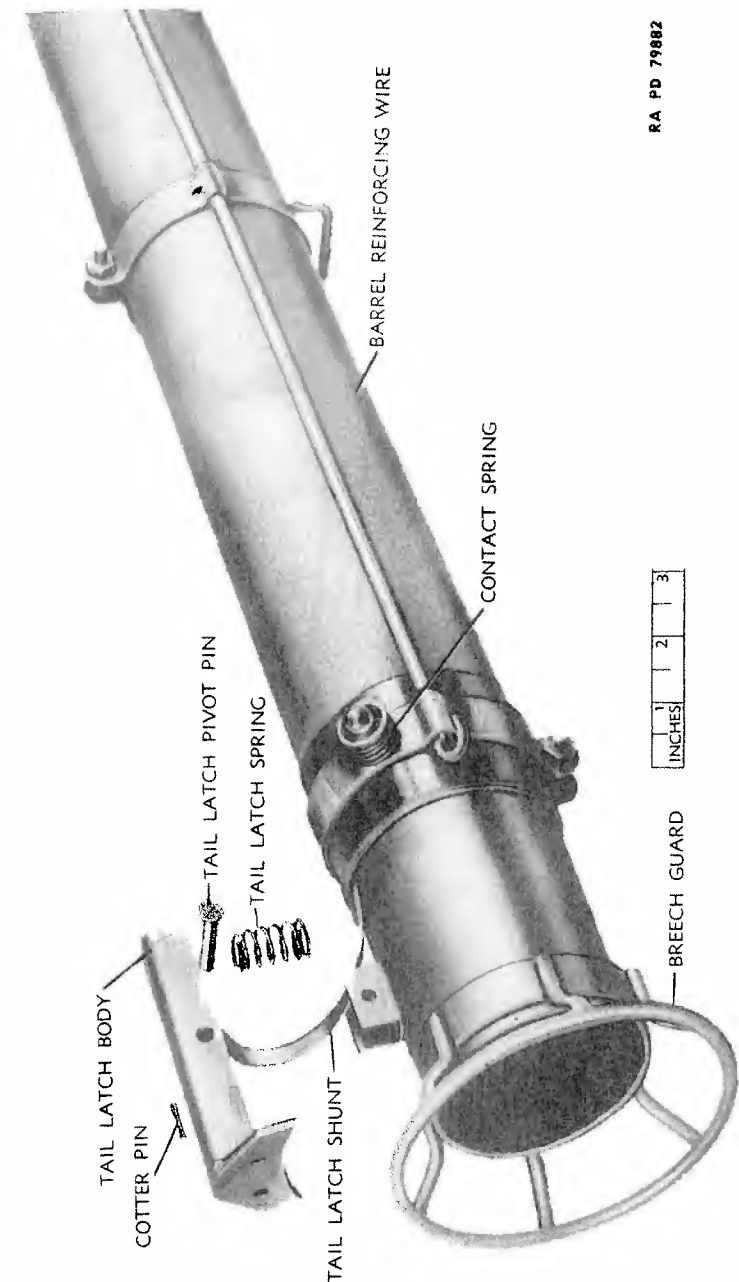
a. **General.** The 2.36" rocket (fig. 15), consists of a head, a stabilizer tube, and a finned tail. The head of the H.E., A.T. rocket contains a high-explosive charge; the head of the practice rocket is inert. The stabilizer tube is closed at the forward end by a plug, containing the fuze, which screws into the head. A safety pin passes through the plug and the fuze, and prevents the fuze from functioning while it remains in place. The tail assembly attached to the rear of the tube consists of a nozzle to which the fins are welded. The stabilizer tube contains the propelling charge and an electric igniter. The lead wires of the igniter pass through the nozzle; the short lead is soldered to a fin, the long lead is stripped of insulation for approximately 6 inches from the end. The end is formed into a tab and is lightly taped to another fin. This wire is known as the contact wire (fig. 14). The nozzle is closed with a cardboard disk to protect the propelling charge from dirt and moisture.

b. **Painting and Marking.** H.E., A.T. rockets are painted olive-drab and marked in yellow with type, model, and lot number. Practice rockets are painted black and marked in white.

c. **Preparation for Firing.** Rockets are prepared for firing by the following steps:

- (1) Unseal package and remove rocket from packing.

DISASSEMBLY AND ASSEMBLY



RA PD 79882

Figure 13 — Rear of Launcher

2.36-INCH A.T. ROCKET LAUNCHER M1A1

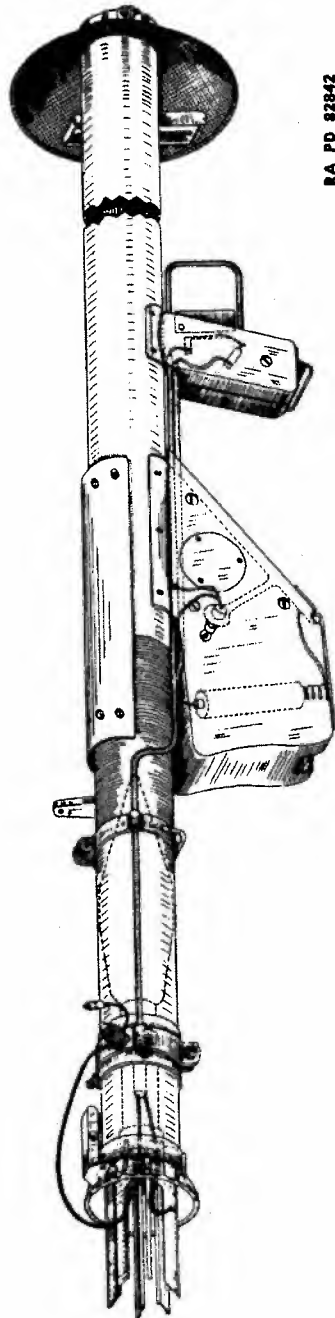


Figure 14 — Rocket Launcher Showing Electrical System

Section VII

AMMUNITION

	Paragraph
Authorized rounds	20
Identification	21
Description	22
Data	23
Effect	24
Care and precautions in handling	25
Packing	26
Field report of accidents	27

20. AUTHORIZED ROUNDS.

a. The ammunition currently authorized for use in Launcher, rocket, A.T., 2.36", M1A1, comprises the following rounds: ROCKET, H.E., A.T., 2.36", M6A3; ROCKET, H.E., A.T., 2.36", M6A1. ROCKET, practice, 2.36", M7A3; ROCKET, practice, 2.36", M7A1.

21. IDENTIFICATION.

a. **General.** Ammunition is identified by the painting and marking on the item and all its packings. Complete identification of an item of ammunition consists of:

- (1) The standard nomenclature, which includes type, size, and model designation.
- (2) The ammunition lot number, which, in general, includes the loader's lot number, the loader's symbol, and the date of loading.

b. **Standard Nomenclature.** Standard nomenclature is established in order that each item issued by the Ordnance Department may be specifically designated. Standard nomenclature for rockets is published in Standard Nomenclature List No. S-9. The use of standard nomenclature is mandatory for all purposes of record.

c. **Model.** When an item is adopted, it is assigned a model designation which consists of the letter "M" and an arabic numeral. If the item is modified, this is shown by adding the letter "A" and the appropriate numeral to the model designation.

d. **Lot Number.** The ammunition lot number is used to identify a quantity of items manufactured under uniform conditions and which is expected to function uniformly. The ammunition lot number is required in all reference to specific items of ammunition in records and reports.

e. **Ammunition Identification Code.** In order to facilitate requisitions and records of ammunition in the field, each item of ammuni-